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Factor Structure of Posttraumatic Stress Symptoms among Torture Survivors

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Running head: POSTTRAUMATIC STRESS AMONG TORTURE SURVIVORS

Factor Structure of Posttraumatic Stress Symptoms among Torture Survivors

by

Ginger Villareal Armas, MA, MS

A Dissertation Presented to the Faculty
of the Center for Psychological Studies
at Nova Southeastern University
in Partial Fulfillment of the Requirements
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DISSERTATION APPROVAL SHEET

This dissertation was submitted by Ginger Villareal Armas under the direction of the Chairperson of the dissertation committee listed below. It was submitted to the Center for Psychological Studies and approved in partial fulfillment of the requirements for the degree of Doctor of Philosophy in Clinical Psychology at Nova Southeastern University.

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Abstract

The central aim of the current study is to examine structural models of posttraumatic stress symptoms, as measured by the Harvard Trauma Questionnaire-Revised (HTQ-R; Mollica et al., 1992; Mollica, McDonald, Massagli, & Silove, 2004). Participants were international torture survivors who sought psychological treatment from a torture rehabilitation center in the United States. It was hypothesized that the factor structure of posttraumatic stress reactions among this heterogeneous sample of torture survivors would be consistent with the aroused intrusion model (Rasmussen, Smith, & Keller, 2007) rather than the dysphoria model (Simms, Watson, & Doebbeling, 2002). In order to evaluate model superiority, confirmatory factor analyses (CFAs) were conducted. It was also hypothesized that avoidance and numbing are two discrete factors in the aroused intrusion model. To determine whether these two constructs are distinct, convergent and discriminant validity were examined. Lastly, it was hypothesized that there is no difference in the means of the latent variable emotional numbing across culture. A one-factor ANOVA was conducted to compare means of the numbing construct between ethnic groups. The findings indicate that the dysphoria model was marginally more preferential than the aroused intrusion model (Rasmussen, Smith, and Keller, 2007; Simms, Watson, & Doebbeling, 2002). The results of a post hoc CFA support previous research, which suggests that a four-factor structure is preferred over the

previously accepted three-factor model (American Psychiatric Association, 2000). The findings also suggest that emotional numbing and avoidance are two separate factors. Lastly, the ANOVA resulted in the failure to reject the null hypothesis. Future research is needed to establish model superiority for posttraumatic stress reactions among torture survivors and the generalizability of the model across cultures.

CHAPTER I

Statement of the Problem

The United States is the world's top recipient of new asylum claims, which includes an estimated 74,000 asylum seekers (United Nations High Commissioner for Refugees, 2012). There is a high prevalence rate of mental disorders and history of torture among refugees (Fazel, Wheeler, & Danesh, 2005; Mills et al., 2005; Smith, Keller, & Lhewa, 2007). In fact, it has been estimated that 500,000 torture survivors are currently living in the United States (Center for Victims of Torture, 2012).

Torture survivors endure three phases of traumatization: "an increase in repression and persecution in the survivor's native country; then comes a period in which the survivor experiences or witnesses direct war trauma, torture, and/or other traumatic deprivations; and then the survivor is confronted with the difficult and long-term process of being uprooted and living in exile" (Smith, Keller, & Lhewa, 2007, p. 7). Torture has complex physical and psychological consequences, including concurrent injuries due to a history of overlapping torture events, including repeated battering, sexual violence (e.g., genital mutilation), threats, and/or witnessing torture and/or death of others (e.g., family members). In addition to the torture experience itself, the aftermath of torture is disruptive to the survivor (Physicians for Human Rights, 2001). Following the torture event(s), survivors may flee to another country due to a reasonable fear of arrest, persecution, further torture, and/or death.

Survivors may suffer additional traumatic experiences during the emigration process, especially if they abscond without documentation from their countries of origin. The unauthorized immigration of torture survivors is typically a dangerous

journey through areas such as deserts, jungles, or combat zones. It is characterized by uncertainty, it may take an indeterminate length of time, and the future is unpredictable. Since their precipitous flight often leads them to travel alone, survivors usually have no social support. On the other hand, they may be dependent on strangers to help them cross borders. Due to a lack of resources, refugees are vulnerable to additional traumatic experiences, including sexual assault and/or battery. During this arduous journey, they may be dealing with the psychological and physical effects of torture, including bodily injuries and psychological traumatic stress reactions.

Refugees typically need to adjust to difficult living conditions in refugee camps and/or detention centers for several days, months, or years. They are displaced to either a developing country, where their priorities are food, shelter, and physical security, or to the West, where predominant problems are acculturation and difficulties with asylum status (Shrestha et al., 1998). The torture experience is characterized by loss, specifically loss of possessions, identity, culture, and social status (Smith, Keller, & Lhewa, 2007). As refugees without the proper documentation, they are unable to obtain gainful employment lawfully, regardless of their level of education and former profession in their native country. Xenophobia could also contribute to their difficulty with securing a job. Since many refugees held prestigious jobs in their native countries, their loss of employment, income, and status can have a negative impact on their recovery (Bandelra, Higson-Smith, Batjes, & Polatin, 2010). By being unable to provide financial support to their families, they may develop a poor self-perception of their overall ability to function.

Due to lack of resources, some survivors may be homeless, while others may live in impoverished neighborhoods which often have high prevalence rates of crime and racial conflict. Smith, Keller, and Lhewa (2007) summed up the literature by describing how “it may not be migration itself that causes the increased symptomatology for refugees, but the severe stress of the migration under harrowing circumstances, and the multiple levels of disempowerment and insecurity faced in the new environments” (p. 10). Additionally, resettlement can disrupt cultural traditions, such as when a patriarchal family structure is challenged by Western norms (Alexander, Blake, & Bernstein, 2007).

Overall, there is currently a high prevalence rate of international human rights violations. Amnesty International (2015) has documented the existence of torture or other human rights violations in 160 countries. Although there is a growing need to provide services to torture survivors, there is a considerable gap in the literature on the impact of torture. Specifically, there is a need for more research on posttraumatic symptomatology among torture survivors and the effects of torture among individuals from diverse cultures (King et al., 2009; Punamaki, Quota, & Sarraj, 2010).

The purpose of this investigation is to assess the structure of posttraumatic stress symptoms in torture survivors. The diagnosis of posttraumatic stress disorder (PTSD) has been criticized as an ethnocentrically Western construct, which might not be applicable to traumatized individuals from non-Western societies (Chakraborty, 1991; Quiroga & Jaranson, 2005). There is considerable debate in the literature about the universality of PTSD (e.g., Breslau, 2005; de Jong, 2005). The ethnocultural study of PTSD has focused on whether or not PTSD is valid across cultures and whether or

not there are variations in the manifestation of traumatic stress reactions among individuals from diverse populations. Accurately modeling the structure of posttraumatic stress symptoms in torture survivors might improve understanding of the mechanisms underlying trauma. Additionally, it could increase the effectiveness of psychotherapeutic interventions by enabling them to be more sensitive to cross-cultural and diversity issues.

CHAPTER II

Review of the Literature

Defining, Classifying, and Measuring Torture

Although scientific research on torture has spanned over 40 years, no consensus has been reached on an operational definition of torture. According to Article 1 of United Nations Convention Against Torture (UN CAT), torture is defined as:

...any act by which severe pain or suffering, whether physical or mental, is intentionally inflicted on a person for such purposes as obtaining from him or a third person information or a confession, punishing him for an act he or a third person has committed or is suspected of having committed, or intimidating or coercing him or a third person, or for any reason based on discrimination of any kind, when such pain or suffering is inflicted by or at the instigation of or with the consent or acquiescence of a public official or other person acting in an official capacity. It does not include pain or suffering arising only from, inherent in or incidental to lawful sanctions (United Nations, 1989, p. 17).

The World Medical Association's (WMA) broad definition of torture is less restrictive than the UN CAT. Known as the Tokyo Declaration of 1975, the WMA defines torture as "...the deliberate, systematic or wanton infliction of physical or mental suffering by one or more persons acting alone or on the orders of any authority, to force another person to yield information, to make a confession, or for any other reason" (Gerrity, Keane, & Tuma, 2001, p. 6). Green, Rasmussen, & Rosenfeld's (2010) review of the torture literature found that 69.9% ($n = 146$) of the reviewed studies ($N = 209$) did not even refer to any definition of this primary construct. The remaining studies referenced either the definition given by the United Nations ($n = 29$; 13.9%) or the World Medical Association ($n = 19$; 9.1%), while 1.4%

($n = 3$) of the studies referred to both definitions. Green, Rasmussen, & Rosenfeld (2010) concluded that there needs to be a more standardized operational definition of torture in the research literature. The authors explained that well-defined constructs are necessary if scientific torture research is to have clinical utility and to inform policy debates.

Hooberman and colleagues (2007) have noted that the most commonly used torture categories include physical assault (e.g., “beatings, sexual assault and rape, electric shock, burning, forced standing, hanging by the wrists, asphyxiation, not being allowed to use the bathroom or clean one’s body... and exposure to bright light”), psychological abuse (e.g., “threats of death or physical torture, being stripped naked and other forms of humiliation, extensive solitary confinement, being forced to witness violence... and sensory deprivation”), and war-related trauma (e.g., “lack of food, water, and shelter, experiencing the death or disappearance of close friends or family members, exposure to combat and dead bodies”) (p. 109).

Four notable studies have attempted a systematic categorization of the torture dimension. Cunningham and Cunningham’s (1997) study evaluated the association between torture experiences and trauma symptoms in a sample of 191 refugee clients in Australia. The authors conducted principal components analyses (PCA), which yielded six factors including “‘common torture’ (i.e., beating, isolation, threats, and bondage), ‘torture of family members,’ ‘fear of death’ (e.g., mock executions, near-drowning), and ‘passive torture’ (e.g., being blindfolded, forced standing, and sleep and water deprivation)” (Hooberman et al., 2007, p. 110). The remaining two factors

could not be interpreted because there was not a clearly identifiable theme among the items.

Silove and colleagues (2002) examined whether it was possible to extract a separate torture dimension from other traumatic experiences on the Harvard Trauma Questionnaire (HTQ; Mollica et al., 1992). The authors conducted a PCA on the 16 HTQ trauma categories with Tamil refugees living in Australia. The authors extracted five trauma factors, including “persecution” (factor 1), “suffocation and loss of consciousness” (factor 2), “exposure to violent death” (factor 3), “war exposure” (factor 4), and “torture” (factor 5). Factor 5 included the items torture, forced isolation, and beating to the head (which also loaded on factor 2). A correlation matrix of the five factors suggested that “the torture dimension was relatively independent of other forms of war trauma, except for a predictable association of torture with the general persecution factor” (Silove et al., 2002, p. 52).

After reviewing the two studies by Cunningham and Cunningham (1997) and Silove and colleagues (2002), Hooberman and colleagues (2007) attempted to provide a more accurate representation of the patterns of trauma experiences among torture survivors by including a larger, more heterogeneous sample and using HURIDOCS codes (Dueck & Task Force Members, 1993), which is a well-known classification system for the categorization of traumatic events. The sample ($N = 325$) included patients from Bellevue Hospital/NYU Program for Survivors of Torture. The participants immigrated to the United States from 54 countries, including Tibet ($n = 72$), Sierra Leone ($n = 53$), and Guinea ($n = 24$). Using a factor analytic approach, the authors sought to categorize the types of torture and to determine how these forms

relate to demographics and traumatic stress reactions. They extracted five factors: “witnessing torture,” “family torture” (e.g., witness torture to family, family harassed), “beating,” “rape/sexual assault,” and “deprivation” (e.g., deprivation of medical care and deprivation of hygiene or sanitation) (Hooberman et al., p. 118). The authors acknowledged some similarities to the previous two studies (Cunningham & Cunningham, 1997; Silove et al., 2002). Most notably, the authors had extracted a similar factor to “torture of family members” (Cunningham & Cunningham, 1997). Hooberman and colleagues (2007) observed an important difference, specifically, that their analysis yielded a “rape/sexual assault” factor, which was not mentioned in the previous two studies. More recently, Punamaki, Quota, & Sarraj (2010) examined how different forms of torture are correlated with PTSD and somatic symptoms among Palestinian males who were former political prisoners (N = 275). The authors conducted a PCA, which extracted “physical torture,” “psychological torture,” “sensory discomfort and deprivation,” and “beatings.”

To identify torture history, research has mostly used standardized questionnaires or checklists and structured or semi-structured interviews, though some studies have neglected to describe a systematic methodology for identifying its occurrence altogether (Green, Rasmussen, & Rosenfeld, 2010). The Harvard Trauma Questionnaire (HTQ; Mollica et al, 1992; Mollica, McDonald, Massagli, & Silove, 2004) has been most commonly used to identify torture history in survivors; however, there has been no standardization for what constitutes torture. In critiquing the torture literature, Green, Rasmussen, and Rosenfeld (2010) provide the example that

“solitary confinement was referred to as both a form of torture (Mollica, McInnes, Pham, Fawzi, Murphy & Lin, 1998) and a condition of the environment in which torture occurs (Gonsalves, 1990)” (p. 529).

The severity of the torture experience has been typically determined by frequency of torture, its duration, survivors’ self-reports of subjective distress during the torture experience, and clinicians’ ratings of torture severity (Green, Rasmussen, & Rosenfeld, 2010). Basoglu’s Semi-Structured Interview for Survivors of Torture (Basoglu, Livanou, & Crnobaric, 2007) measures torture severity by tallying the total number of torture forms (from a list of 44 events), frequency of torture events, duration of captivity, and the survivor’s rating of subjective distress associated with each torture event on a 5-point Likert scale.

Torture severity has been perceived as a determinant of subsequent traumatic stress responses. Specifically, the “dose-response” theory of trauma suggests that the severity of the traumatic experience exacerbates the rate and severity of the psychological disturbance (Keller et al., 2006; McNally, 2003). There has been some empirical support for trauma severity as a significant predictor of posttraumatic stress disorder (PTSD) in studies of combat veterans, as well as survivors of rape, volcanic eruption, fire disaster, and intimate partner violence (Basoglu & Paker, 1995). Mollica and colleagues (1998) studied this phenomenon by examining the relationship between cumulative torture events and symptoms of PTSD and major depression. The sample included Vietnamese ex-political detainees ($n = 51$) and a less traumatized comparison group ($n = 22$) of Vietnamese men. The findings suggested that trauma severity was positively associated with a higher rate of PTSD symptoms;

however, the authors acknowledged methodological limitations, including small sample size.

McNally (2003) has asserted that the dose-response model is “far from straightforward” and that “many studies fail to support” the model (p. 233). Furthermore, Basoglu and Paker (1995) examined the severity of trauma as a predictor of long-term psychological functioning. Their investigation suggested that the cumulative exposure to torture events did not predict posttraumatic symptomatology; rather, the predictor was ratings of perceived distress. Overall, based on a review of the torture literature, the incidence of PTSD after trauma exposure seems to vary widely depending on the sample (Bowman, 1999).

Despite attempts by researchers to advance methodology in the torture literature, it has been challenging to define, to classify, and to measure torture in a systematic way, (Green, Rasmussen, & Rosenfeld, 2010). According to Basoglu, Livanou, and Crnobaric (2007), the challenge of defining torture is due to insufficient knowledge about “(1) the severity of mental suffering associated with particular stressors during detention or captivity, (2) the psychological mechanisms by which these stressors exert their traumatic impact, and (3) their long-term psychological effects” (p. 278). In addition, it has been challenging to evaluate the effects of individual torture experiences, because several torture events may occur concurrently or in clusters. This demarcation problem (i.e., the challenge of distinguishing discrete torture events) also makes it difficult to have a standardized classification system for types of torture.

Although there are significant obstacles to defining and operationalizing torture, gaining more understanding of torture is important. Improving knowledge about this construct will be useful in terms of clinical utility for torture survivors and, in general, other traumatized individuals (Basoglu & Paker, 1995). Specifically, Keller and colleagues (2006) asserted, "...understanding the types of experiences that are most likely to generate lasting psychological distress can help inform prevention efforts aimed at minimizing these long-term effects of trauma. By identifying high-risk subgroups within the broader population of torture survivors, targeted interventions may be more likely to succeed" (p. 193).

The Effects of Torture and the Aftermath of Torture

Due to methodological difficulties in defining and operationalizing torture, it has also been challenging to classify the sequelae of torture. In other words, it has been difficult to describe the effects of torture when there is no consensus for what constitutes torture. According to a review of the literature, the physical and psychological effects of torture are complex (Goldfeld et al., 1988; Punamaki, Quota, & Sarraj, 2010; Somnier et al., 1992), and some studies have been criticized for not taking into account the time delay between the torture event and the evaluation (Basoglu, Jaranson, Mollica, & Kastrup, 2001).

The physical sequelae typically concern the musculoskeletal system and may include structural bodily injuries and deterioration or loss of function (Basoglu, Jaranson, Mollica, & Kastrup, 2001; Rasmussen, 1990). The physical consequences of torture have been commonly documented as the result of "blunt blows to the body,

repeated blows to certain parts of the body such as in *falanga* (beating of the soles of the feet); hanging by the wrists or the arms; being tied around the body, neck, or extremities; electrical torture; torture involving cuts, burns, or corrosion with acid; torture involving the teeth such as drilling, extraction, or violent blows; prolonged immobilization in forced positions; and sexual assault” (Basoglu, Jaranson, Mollica, & Kastrup, 2001, p. 37).

Physical torture may have long-term effects, as evidenced by survivors’ reports of severe chronic pain and injury many years after the torture event (Thomsen, Eriksen, & Smidt-Nielsen, 2000). There is a high comorbidity of PTSD and chronic pain in torture survivors (Lledl & Knaevelsrud, 2008). Chronic injuries from torture were found to be robust predictors of long-term psychopathology (Rasmussen, Rosenfeld, Reeves, & Keller, 2007). Repeated blows to the head may result in traumatic brain injury, which also has psychological consequences, such as elevated levels of anger and irritability (Hart, Vaccaro, Hays, & Maiuro, 2012). Brain trauma could also result in major or mild neurocognitive disorders (Wenzel, Frewer, & Mirzaei, 2015). Overall, it has been challenging to isolate effects of discrete traumatic experiences, because torture survivors have often endured multiple torture events that give rise to concurrent injuries (Basoglu, Jaranson, Mollica, & Kastrup, 2001).

The psychological effects of torture have been well-documented in the last 30 years; however, literature reviews (Basoglu, Jaranson, Mollica, & Kastrup, 2001; Goldfeld et al., 1988) have noted that several studies have methodological flaws, including an uncontrolled design and insufficient description of methods used. Based on the torture literature, the most prevalent psychological problems for torture

survivors include “affective symptoms (chronic anxiety, depression), cognitive impairment (memory defects, loss of concentration) and changes in identity” (Somnier et al., 1992, p. 66). The most common diagnoses given to torture survivors are PTSD and Major Depressive Disorder (MDD; Momartin, Silove, Manicavasager, & Steel, 2004; Shrestha et al., 1998). Dissociative symptoms among torture survivors have also been documented (McDonnell, Robjant, & Katona, 2013; Ray et al., 2006). Buhman and colleagues (2014) found a high prevalence of psychotic symptoms as well as comorbid disorders in traumatized refugees.

Research indicates that psychological torture is also associated with somatic symptoms, such as weight loss, hypertension, and bodily aches (Punamaki, Quota, & Sarraj, 2010; Van Ommeren, Sharma, Sharma, Komproe, Cardena, & de Jong, 2002). Rasmussen, Rosenfeld, Reeves, and Keller (2007) examined long-term psychopathology among Punjabi Sikh torture survivors (N = 116). Their findings supported a conclusion that there is a relationship between physical and psychological trauma. Specifically, the authors found that chronic injuries acted as a mediator between torture and PTSD and that “injuries may be a proxy for the severity of the torture experience, as lasting injuries may be associated with harsher physical abuse” (p. 738).

Overall, the psychological consequences of torture are complex and can have long-term effects on individuals beyond the torture experience itself (de Jong et al., 2001; Holtz, 1998; Jaranson et al., 2004; Mollica, 2004; Rasmussen, Rosenfeld, Reeves, & Keller, 2007; Shrestha et al., 1998; Tang & Fox, 2001). The aftermath of the torture experience may compound mental health difficulties. Specifically, post-

migration factors (e.g., economic difficulties, limited social support, bereavement, challenges from the asylum application process) could exacerbate any psychological symptoms (Basoglu et al., 2001). Further research is needed about whether psychological effects of torture are universal or culture-specific (Punamaki, Quota, & Sarraj, 2010).

Structural Models of Posttraumatic Symptomatology

There are several structural models of posttraumatic symptomatology. The three-factor model corresponds to the *Diagnostic and Statistical Manual of Mental Disorders* (4th edition; *DSM-IV-TR*) PTSD criteria. Specifically, the three factors include reexperiencing, avoidance, and increased arousal (American Psychiatric Association, 2000). Although expert consensus determined that the symptoms would be divided into three clusters for the *DSM-IV-TR* (Brett, Spitzer, & Williams, 1988; Buckley, Blanchard, & Hickling, 1998), this structure of symptomatology has been challenged due to limited empirical support (Palmieri, Marshall, & Schell, 2007; Yufik & Simms, 2010). Researchers have most commonly conducted factor analyses to investigate structural models of traumatic stress reactions. The primary method is to use both exploratory factor analysis (EFA) and confirmatory factor analysis (CFA) of measures of PTSD. Factor analytic studies operate on the premise that if the PTSD symptomatology is valid, then three factors (i.e., reexperiencing, avoidance, and increased arousal) would be extracted during the analysis.

On the contrary, many factor analytic investigations have suggested alternative structural models (King, Leskin, King, & Weathers, 1998; Palmieri, Marshall, & Schell, 2007; Rasmussen, Smith, & Keller, 2007; Vinson & Chang,

2012). The most prominent of these are three four-factor models: the emotional numbing model (King, Leskin, King, & Weathers, 1998), the dysphoria model (Simms, Watson, & Doebbell, 2002), and the aroused intrusion model (Rasmussen, Smith, & Keller, 2007). The emotional numbing model is similar to the three-factor PTSD model, but it expands avoidance into two separate factors: avoidance and emotional numbing (King, Leskin, King, & Weathers, 1998). King and colleagues conducted a confirmatory factor analysis of the Clinician-Administered PTSD Scale (CAPS; Blake et al., 1990) to test structural models of PTSD with male veterans ($N = 524$) who were seeking treatment at the National Center for PTSD in Boston. The model of best fit corresponded to reexperiencing, effortful avoidance, emotional numbing, and hyperarousal.

In a review of factor analytic studies, Asmundson, Stapleton, and Taylor (2004) supported this position of two distinct symptom clusters. According to them, it was because the data suggested that “different treatment modalities have differential effects on reducing avoidance but not numbing... patients with more severe pretreatment numbing have poorer treatment outcomes... avoidance and numbing have different patterns of correlation with depression, and... they have different correlations with physiological indices of attention” (p. 467).

Palmieri, Marshall, and Schell’s study (2007) provided further support for the emotional numbing model. Participants included Cambodian refugees ($N = 488$) who had been living in the United States for 20 years. The authors conducted a confirmatory factor analysis (CFA) of the Cambodian version of the Harvard Trauma Questionnaire (HTQ; Mollica et al., 1992), which was administered in Khmer by

trained Cambodian lay interviewers. The CFA indicated that the emotional numbing model was the best fit to the data collected. Their findings also indicated that there is a clear demarcation between avoidance and emotional numbing. This study made a unique contribution to the CFA literature by examining discriminant validity through a latent variable approach. The authors concluded that avoidance and emotional numbing were separate factors because they both had a distinct pattern of association with depression. The authors also acknowledged that there were limitations in their study, including the fact that the number of items assessing avoidance was limited and that the findings lacked external validity (i.e., generalizability beyond the Cambodian sample).

Rasmussen, Smith, and Keller (2007) developed the aroused intrusion model based on their literature review on posttraumatic stress among Africans and their own clinical observations when working with African torture survivors. The aroused intrusion model includes four factors: aroused intrusion, which includes insomnia, difficulty concentrating, and other intrusion symptoms; numbing; avoidance; and hypervigilance, which includes constant scanning, exaggerated startle response, and irritability or outbursts of anger. Rasmussen, Smith, and Keller tested five models of PTSD: a one-factor model of a single latent variable for all posttraumatic symptomatology, the three-factor model consistent with the three symptom clusters of the *DSM-IV-TR*, the emotional numbing model, the dysphoria model, and the aroused intrusion model. The authors conducted a CFA on the HTQ with West and Central African refugees who participated in an intake process in order to obtain services from a torture treatment clinic in New York City. The findings indicated that all four-

factor models were a good fit for the data; however, based on their clinical experience with torture survivors, the authors expressed their preference for their aroused intrusion model. Specifically, the authors described how it was difficult to distinguish between symptoms of hyperarousal and intrusion. They gave an example of how, when their clients experience sleep disturbance (i.e., a hyperarousal symptom), it has often been associated with nightmares (i.e., an intrusion symptom). Additionally, the findings gave support to the position that avoidance and emotional numbing are two discrete factors.

The dysphoria model includes the following four factors: general dysphoria, which includes insomnia, irritability or outbursts of anger, difficulty concentrating, and symptoms of numbing; intrusion; avoidance; and hyperarousal, which includes hypervigilance and exaggerated startle response (Simms, Watson, & Doebbell, 2002). Vinson and Chang (2012) examined the PTSD symptom structure among West African civilian refugees ($N = 3,802$). Participants had fled Sierra Leone during the civil war between 2001 and 2006 and experienced traumatic events such as capture, beatings/torture, separation from family, and family torture. The authors conducted EFA and CFA of the 17-item symptomatology section of the Posttraumatic Stress Diagnostic Scale (PDS; Foa, 1996). Despite replicating the factor analytic procedures of Rasmussen and colleagues (2007), findings suggested that the dysphoria model was “marginally superior” in terms of best fit to the data, as compared to other models, including the aroused intrusion model (Rasmussen, Smith, & Keller, 2007). It is notable that Vinson and Chang (2012) used a different measure (i.e., PDS) than the one (i.e., HTQ) used by Rasmussen, Smith, and Keller. Vinson and Chang (2012)

acknowledge that their findings do not serve as a cross-cultural validation of PTSD and that “PTSD still may not capture other trauma responses that may exist for cultural, experiential, or other reasons” (p. 230).

Overall, there have been mixed results from factor analytic investigations of structural models of posttraumatic symptomatology. There has been no consensus for the model of best fit. Although recent studies seem to support a four-factor model, researchers have been proposing additional models of PTSD, including a five-factor model (Trautmann et al., 2015) and a seven-factor model (Pietrzak et al., 2015). Similarly, Herman (1997) recognized that the effects of a prolonged trauma history could have a more complicated symptom presentation than the reactions resulting after a single traumatic event. As a result, she proposed her conceptualization of Complex Posttraumatic Stress Disorder (cPTSD), which includes seven criteria. Kissane, Szymanski, Upthegrove, and Katona (2014) conducted a pilot study in order to compare cPTSD symptoms between traumatized asylum seekers who have a history of human trafficking, domestic violence, and/or torture. They concluded that all of the participants exhibited extensive cPTSD symptoms, regardless of the type of trauma they experienced. They asserted that undiagnosed cPTSD could reduce the efficacy of clinical treatment.

King et al. (2009) indicated that further research is needed to examine factorial stability cross-culturally. In general, traumatic stress reactions are believed to consist of two components: autonomic nervous system (ANS) responses, which are more generalizable, and behavioral sequelae, which may be more variable due to cross-cultural differences (Marsella, Friedman, & Spain, 1996). Rasmussen, Smith,

and Keller (2007) asserted, “modeling the symptom structure of PTSD across cultures should thus begin with identifying and making a distinction between those symptom factors directly associated with ANS functioning and those more likely to vary” (p. 272).

Present Study and Hypotheses

The question addressed by the present study is which model is the best fit for a heterogeneous sample of torture survivors? It was hypothesized that the four-factor aroused intrusion model (Rasmussen, Smith, Keller, 2007) best represents posttraumatic stress symptomatology among torture survivors. It was also hypothesized that avoidance and emotional numbing are two discrete factors in the aroused intrusion model. There is considerable empirical support (Asmundson, Stapleton, & Taylor, 2004; King, Leskin, King, & Weathers, 1998; Litz, 1992; Palmieri, Marshall, & Schell, 2007; Rasmussen, Smith, & Keller, 2007) for this stance; however, no studies have been conducted to investigate this claim with a demographically heterogeneous sample of torture survivors. Lastly, it was hypothesized that there would be no difference in the means on the emotional numbing construct across ethnic groups. This has implications for whether or not numbing would be considered a culturally-bound factor or an autonomic nervous response. In other words, if there is no difference in the means, that would suggest that numbing is an involuntary behavior and not significantly influenced by one's cultural background (i.e., more universal).

CHAPTER III

Method

Participants

The current study used a between-participants design; differences between participants were observed at one point in time. There were 137 participants, all of whom endorsed having a history of political torture. Fifty-four percent were males ($n = 74$) and 46% were females ($n = 63$). The average participant was approximately 48 years old ($M = 48.09$, $SD = 14.67$). During the intake process, they responded to questions about demographic variables, including marital status and religion. Seventy-five percent reported being married ($n = 103$), 12% reported being single ($n = 16$), 2% reported being widowed ($n = 3$), and 1% did not disclose marital status ($n = 1$). The remaining 10% ($n = 14$) indicated that they were either divorced or separated or had a marriage that had been annulled. Additionally, the majority (64%) of participants reported that they were Christian ($n = 87$). The remaining participants identified as Muslim ($n = 24$; 18%), Agnostic ($n = 4$; 3%), Buddhist ($n = 3$; 2%), or other ($n = 7$; 5%). Nine percent of the participants ($n = 12$) chose not to report their religious affiliation.

The majority (47%) of the 137 participants identified as Hispanic/Latino ($n = 65$), and originated from various countries, including Argentina, Colombia, Cuba, Guatemala, Honduras, Panama, and Venezuela. Of the remaining participants, 12% were African ($n = 16$), 18% were Asian ($n = 24$), 8% were European ($n = 11$), and 14% were of Middle Eastern descent ($n = 19$). These participants had immigrated to the United States from countries such as Chad, the Democratic Republic of Congo,

Eritrea, Ethiopia, Liberia, Sierra Leone, Myanmar, Vietnam, Bosnia and Herzegovina, and Iraq. This sample was obtained through a retrospective review of a client database from the Florida Center for Survivors of Torture (FCST). Table 1 presents the frequencies and percentages of the participant demographics. Table 2 presents the frequencies and percentages of the participants' countries of origin.

Table 1
Frequencies and Percentages for Participant Demographics

Demographic	<i>n</i>	%
Gender		
Female	63	46
Male	74	54
Marital status		
Divorced/Annulled/Separated	14	10
Married	103	75
Not reported	1	1
Single	16	12
Widowed	3	2
Religion		
Agnostic	4	3
Buddhist	3	2
Christian	87	64
Muslim	24	18
Not reported	12	9
Other	7	5
Ethnic Identity		
African	16	12
Middle Eastern	19	14
Asian	24	18
European	11	8
Hispanic/Latino	65	47
Other	2	1

Table 2
Participant Countries of Origin

Country	<i>n</i>	%
Argentina	2	1
Bosnia & Herzegovina	11	8
Chad	1	1
Colombia	7	5
Cuba	44	32
DRC	4	3
Eritrea	1	1
Ethiopia	3	2
Guatemala	1	1
Honduras	2	1
Iraq	22	16
Liberia	2	1
Myanmar	16	12
Panama	1	1
Sierra Leone	4	3
Unknown	1	1
Venezuela	8	6
Vietnam	7	5

Setting and Apparatus

FCST, a federally-funded, torture rehabilitation program of Gulf Coast Jewish Family Services, Inc. (GCJFS), has established locations in Florida (Alexander, Blake, & Bernstein, 2007). Established in 2000, FCST takes a community-based approach, which provides comprehensive care to survivors of political and state-sponsored torture. To qualify for the FCST program, an individual needs to report torture experiences which meet the U.S. definition of torture, i.e., "...an act committed by a person acting under the color of law specifically intended to inflict severe physical or mental pain or suffering (other than pain or suffering incidental to lawful sanctions) upon another person within his custody or physical control" (Farrar, Yocum, & Mellman, 2009, p. 2). Examples of the types of torture include "systematic

beating, sexual torture, electrical torture, suffocation, burning, bodily suspension, pharmacological torture, mutilations, dental assaults, deprivation and exhaustion, threats about the use of torture, witnessing the torture of others, humiliation, and isolation” (Farrar, Yocum, & Mellman, 2009, p. 2).

FCST clients are eligible to receive services that include intensive case management and referrals to medical, mental health, legal, and social service providers. Although the FCST has a program for refugee youth, only clients over the age of 18 were included in the sample because the primary self-report questionnaire used (i.e., the Harvard Trauma Questionnaire- Revised) was developed for and validated on adult samples.

The Harvard Trauma Questionnaire (HTQ), a self-report symptom-rating scale, was developed by Mollica and colleagues (1992). The HTQ Cambodian version (which is also known as the HTQ Original) was revised in 2004 (Mollica, McDonald, Massagli, & Silove, 2004). The HTQ (Cambodian Version) – Revised (HTQ-R) currently consists of five parts: Part 1: Trauma Events; Part 2: Personal Description; Part 3: Head Injury; Part 4: Trauma Symptoms; and Part 5: Torture History. The current study focuses on Part 4: Trauma Symptoms, which consists of 16 items and uses a Likert scale (1=Not at all; 2=A little; 3=Quite a bit; 4=Extremely). In addition to the revision of the original Cambodian version, there are several cross-cultural adaptations, including: HTQ Vietnamese Version, HTQ Bosnia-Herzegovina Version, HTQ Iraqi Version, and HTQ Spanish Version. Mollica and colleagues (2004) recommend the use of algorithms to determine the cut-off scores, which are dependent upon the purpose of the assessment and the type of setting where

the evaluation takes place. The HTQ-R was determined to be statistically reliable and valid in multiple studies across multiple populations with a trauma history (Hollifield et al., 2002; Keller et al., 2006).

Procedure

Participants did not provide informed consent for the proposed study due to the retrospective nature of the data; however, during the intake process, they did sign a general consent form, which described the possibility of data collection for research purposes. During the initial session, FCST case managers conducted semi-structured interviews with the participants in order to elicit demographic information such as place of birth, age, family history, educational level, marital status, religion, and asylum status. Trained interpreters facilitated the interview process when it was necessary. If possible, participants were given a culturally-appropriate adaptation of the HTQ. Otherwise, they were administered the HTQ-R (i.e., Cambodian Revised Version). The Institutional Review Board of Nova Southeastern University approved this study. Additionally, this study received approval by the FCST Research Review Committee.

CHAPTER IV

Results

Complications/Qualifications/Limitations

The current study analyzed only 16 out of the 40 items on the Harvard Trauma Question-Revised (HTQ-R). These items (i.e., HTQ1 through HTQ16) were chosen because they corresponded to the manifest variables of two identified trauma models which have garnered empirical support in prior research (Rasmussen, Smith, & Keller, 2007; Simms, Watson, & Doebbeling, 2002). Both of the four-factor models which are evaluated in this study are derived from measures that directly correspond to the DSM-IV-TR criteria for PTSD (American Psychiatric Association, 2000). Furthermore, only 16 items were analyzed because not all of the participants completed the same version of the HTQ. Depending on their ethnicity, the participants in the current study had been administered a culturally-appropriate adaptation of the HTQ. If the HTQ had not yet been adapted for a participant's culture, then he or she was given the HTQ Cambodian Version – Revised (HTQ-R). The different versions did not always have the same number of items for Part 4: Trauma Symptoms. For instance, the HTQ-R has 40 items, whereas the HTQ Iraqi Version has 45 items. All of the adaptations did include the 16 items that were analyzed in the present and previous studies. The Appendix presents a description of HTQ1 through HTQ16.

Prior to completing the primary and secondary analyses, the suitability of the data was checked. Since all of the data were collected at one time point, attrition was not a concern; however, there were some missing data. One hundred thirty-one

participants (95.62%) provided valid responses to all of the 16 HTQ-R items, while six (4.38%) of the respondents had missing data on only one item. Listwise deletion was used to exclude cases with missing values prior to the analyses. Although exclusion of cases is a common approach to handling missing values, there is a disadvantage: statistical power is decreased (Brown, 2006). In consideration of lower power, caution should be used when interpreting the current study's findings.

Next, the Mahalanobis distance (D) statistic was used to identify multivariate outliers (Kline, 2010). Figure 1 shows D plotted against its corresponding Chi-square distribution percentiles. Following a relatively straight line, the points did not demonstrate strong deviations from the theoretical quantiles. This suggests that there are no outliers present in the data. Additionally, the D plot indicates that the assumption of multivariate normality is reasonably met (Ben-Gal, 2010). Lastly, there were no other occurrences that might have affected the representativeness of the sample. The following sections will describe whether the data met the assumptions underlying the statistical tests which have been conducted for the current study.

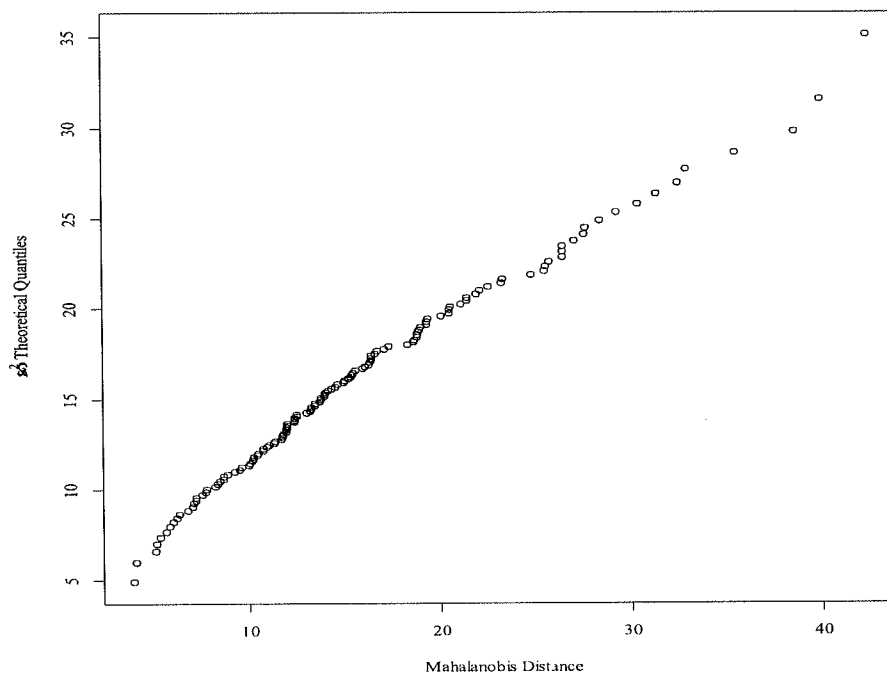


Figure 1. Mahalanobis Distances of the HTQ-R Items 1 through 16

Primary Analyses

It was hypothesized that the four-factor aroused intrusion model (Rasmussen, Smith, Keller, 2007) exhibits significantly better fit to the data than the dysphoria model (Simms, Watson, & Doebbeling, 2002) among varied torture survivors. To evaluate the first hypothesis, confirmatory factor analyses (CFAs) were conducted to evaluate these two models.

In order to assess the factorability of the data, preliminary checks were conducted. Initially, sample size adequacy was considered. Currently, there are no universal standards for how to determine whether or not a sample size is sufficient (Kline, 2004; MacCallum & Hong, 1997; Muthén & Muthén, 2002; Saris & Satorra, 1993). There is a consensus that a larger sample size in factor analytical

investigations is necessary to yield the most accurate results. According to Kline (2010), the sample size ($N = 137$) is not large, though it is not small enough to be untenable. Based on Kline's guidelines, caution needs to be exercised when interpreting the findings of this study due to the medium sample size. Additionally, it is important to consider low statistical power while drawing conclusions.

Multivariate normality is another assumption of factor analysis. To investigate multivariate normality, skewness and kurtosis tests were conducted (Doornik & Hansen, 2008). The significant results of both the kurtosis test ($p < .001$) and the skewness test ($p < .001$) indicated that multivariate normality was violated. Due to the discreteness in the four questionnaire response options, the data are markedly non-normal. In spite of this, the Mahalanobis distances indicated that the data reasonably approximate a normal distribution. Therefore, multivariate normality was reasonable for conducting the CFAs. Nevertheless, the results of the CFAs may be affected by a violation of normality.

The covariance matrices were used for the confirmatory factor analyses (CFAs), which were conducted with Mplus version 7.11 (Muthén & Muthén, 2012). Model superiority was evaluated by examining multiple fit indices, including the overall model chi-square (χ^2), the root mean squared error of approximation (RMSEA), the standardized root mean square residual (SRMR), and the comparative fit index (CFI).

There are not strict cutoff criteria for evaluating model fit (Brown, 2006; Harrington, 2009; Hu & Bentler, 1999; Kline, 2010). Kline's (2010) guidelines include reporting the model chi-square, RMSEA, CFI, and SRMR. Brown (2006), on

the other hand, advises reporting at least one index from each of the three categories of fit indices: absolute fit (e.g., χ^2 , SRMR), parsimony correction (e.g., RMSEA), and comparative fit (e.g., CFI). For interpreting goodness-of-fit indices, several researchers suggest the following cutoff criteria for adequate fit: (1) SRMR and RMSEA are .10 or less (2) CFI is .90 or greater (Rasmussen, Smith, & Keller, 2007; Simms, Watson, & Doebbeling, 2002). Hu and Bentler (1999) recommend more stringent guidelines: (1) SRMR close to .08, (2) RMSEA values close to .06 or below, and (3) CFI values close to .95 or greater. Brown (2006) elaborates that Hu and Bentler's use of the phrase "close to" is purposeful since their guidelines are not rigid "because the recommended cutoff values were found to fluctuate as a function of modeling conditions... and whether or not an index was used in combination with other fit indices" (p. 87).

First, a CFA was conducted on the aroused intrusion model (Rasmussen, Smith, & Keller, 2007), which was composed of the following latent variables: aroused intrusion (with six observed variables), numbing (with five observed variables), avoidance (with two observed variables), and hypervigilance (with six observed variables). Since the goodness-of-fit indices are close to the recommended cutoff values (Hu & Bentler, 1999; Rasmussen, Smith, & Keller, 2007; Simms, Watson, & Doebbeling, 2002), the results of the aroused intrusion model presented an acceptable fit for the data, SRMR = .067, RMSEA = .088, and CFI = .85. In addition to evaluating the model fit, factor loadings and correlations among the factors were inspected in order to confirm that the a priori hypotheses were supported by the results. With almost all ranging from .47 to .69, most of the standardized factor

loadings were moderate to high. Table 3 presents the factor loadings for each of the four factors.

Table 3
Factor Loadings for the Aroused Intrusion Model

Latent construct	Manifest variable	Estimate	Standard error	<i>P</i>	Standardized estimate
Aroused intrusion	HTQ1	1.00	-	-	.07
	HTQ3	4.60	5.46	.40	.52
	HTQ2	5.65	6.67	.39	.66
	HTQ16	3.81	4.51	.39	.47
	HTQ8	5.01	5.95	.39	.61
	HTQ7	6.14	7.27	.39	.65
Numbing	HTQ12	1.00	-	-	.50
	HTQ13	1.00	0.20	<.001*	.56
	HTQ4	1.15	0.22	<.001*	.61
	HTQ5	1.29	0.23	<.001*	.69
	HTQ14	1.09	0.20	<.001*	.65
Avoidance	HTQ11	1.00	-	-	.67
	HTQ15	1.10	0.17	<.001*	.64
Hypervigilance	HTQ6	1.00	-	-	.51
	HTQ10	1.25	0.22	<.001*	.60
	HTQ9	1.06	0.21	<.001*	.50

Note. * $p \leq .050$. Otherwise $p > .050$.

In order to test the dysphoria model (Simms, Watson, & Doebbeling, 2002), another CFA was conducted. This model was composed of reexperiencing (with four observed variables), effortful avoidance (with two observed variables), emotional numbing (with five observed variables), and hyperarousal (with five observed variables). Based on the recommended cutoff values (Hu & Bentler, 1999;

Rasmussen, Smith, & Keller, 2007; Simms, Watson, & Doebbeling, 2002), the results suggest an adequate fit for the data, SRMR = .067, RMSEA = .088, CFI = .85. With almost all ranging from .51 to .72, most of the standardized factor loadings for this analysis were also moderate to high. Table 4 on page 33 presents the factor loadings for each of the four factors.

Table 4
Factor Loadings for the Dysphoria Model

Latent construct	Manifest variable	Estimate	Standard error	<i>p</i>	Standardized estimate
Reexperiencing	HTQ1	1.00	-	-	.10
	HTQ3	3.72	3.49	.28	.55
	HTQ2	4.69	4.34	.28	.72
	HTQ16	3.18	2.97	.28	.52
Effortful Avoidance	HTQ15	1.00	-	-	.64
	HTQ11	0.91	0.13	<.001*	.67
Emotional Numbing	HTQ12	1.00	-	-	.51
	HTQ14	1.07	0.20	<.001*	.65
	HTQ13	1.00	0.19	<.001*	.57
	HTQ4	1.13	0.21	<.001*	.61
	HTQ5	1.26	0.23	<.001*	.68
Hyperarousal	HTQ10	1.00	-	-	.56
	HTQ9	1.24	0.22	<.001*	.64
	HTQ6	1.07	0.20	<.001*	.56
	HTQ7	1.26	0.22	<.001*	.62
	HTQ8	1.05	0.19	<.001*	.59

Note. * $p \leq .050$. Otherwise $p > .050$.

In order to evaluate model superiority, model fit statistics were compared. It was found that the aroused intrusion model had both a slightly higher χ^2 and a slightly

higher Akaike's information criterion (AIC; Kline, 2010) value than the dysphoria model. Therefore, the dysphoria model marginally fit the data better than the aroused intrusion model, although it is unlikely that this is an important difference. Table 5 presents the model fit statistics for both models.

Table 5
Model Fit Statistics

Model	χ^2 (98)	<i>p</i>	SRMR	RMSEA (95% CI)	CFI	AIC
Aroused Intrusion	202.43	.001	.067	.088	.85	5969.79
Dysphoria	202.01	.001	.067	.088	.85	5969.37

It was also hypothesized that the constructs avoidance and emotional numbing were two discrete factors in the aroused intrusion model. For this second hypothesis, convergent and discriminant validity of these constructs were examined. First, it was necessary to determine if the specific manifest variables of each construct demonstrated adequate convergence (i.e., whether or not the indicators were sufficiently correlated with one another). In order to assess convergent validity, factor loadings, the Average Variance Extracted (AVE), and reliability were examined (Hair, Black, Babin, & Anderson, 2010). The standardized estimates of factor loadings need to be .5 or higher in order to be considered significant. Based on the values of the loadings, which are presented in Table 6, there seemed to be sufficient convergent validity for both the numbing and avoidance constructs of the aroused intrusion model.

Table 6
Factor Loadings for Numbing and Avoidance

Latent construct	Manifest variable	Estimate	Standard error	<i>P</i>	Standardized estimate
Numbing	HTQ12	1.00	-	-	.50
	HTQ13	1.00	0.20	<.001*	.56
	HTQ4	1.15	0.22	<.001*	.61
	HTQ5	1.29	0.23	<.001*	.69
	HTQ14	1.09	0.20	<.001*	.65
Avoidance	HTQ11	1.00	-	-	.67
	HTQ15	1.10	0.17	<.001*	.64

Note. * $p \leq .050$. Otherwise $p > .050$.

Next, AVE values were calculated for each construct with equation 1:

$$AVE = \frac{\text{sum of all squared standardized factor loadings}}{\text{number of items}} \quad (1)$$

If the AVE values are above .5, a construct is assessed to have adequate convergent validity (Hair, Black, Babin, & Anderson, 2010). Overall, the aroused intrusion model did not seem to have high convergent validity, based on the low AVE values for aroused intrusion (.35) and hypervigilance (.41). On the other hand, the remaining two AVE values either meet the suggested level of .50 or fall close to that cutoff. Specifically, the AVEs are .64 and .45 for avoidance and numbing, respectively. Lastly, reliability, another indicator of convergent validity, was considered. High construct reliability (i.e., an alpha value of .7 or higher) is indicative of high internal consistency within the manifest variables of a construct, i.e., “that the measures all consistently represent the same latent construct” (Hair, Black, Babin, & Anderson, 2010, p. 687). As evidenced by the high alpha values, the factors numbing

(.80) and avoidance (.78) both have good reliability. Table 7 presents the results of the reliability and validity analyses for the aroused intrusion model.

Table 7
Reliability and Validity Analysis of HTQ-R Items

Item	Factor	Cronbach's Alpha	AVE
HTQ1	Aroused Intrusion	.76	.35
HTQ2			
HTQ3			
HTQ7			
HTQ8			
HTQ16			
HTQ4	Numbing	.80	.45
HTQ5			
HTQ12			
HTQ13			
HTQ14			
HTQ11	Avoidance	.78	.64
HTQ15			
HTQ6	Hypervigilance	.72	.41
HTQ7			
HTQ10			

Next, it was important to evaluate whether the specific manifest variables of the avoidance construct were sufficiently uncorrelated with items that loaded onto the emotional numbing construct. Therefore, discriminant validity was assessed.

For a construct to have high discriminant validity, AVE values need to be greater than the squared correlation estimate between each of the factors (Fornell & Larcker, 1981). Overall, the results suggest that the aroused intrusion model does not have high discriminant validity, though discriminant validity for the constructs avoidance and numbing had some support. The AVE value for aroused intrusion (.35) was lower than the squared factor correlations for numbing (.59), avoidance (.49), and hypervigilance (.94). Likewise, the AVE value for numbing (.45) was lower than the squared factor correlation for hypervigilance (.69). On the other hand, the AVE value for numbing (.45) was greater than the squared factor correlation for avoidance (.21), and the AVE value for avoidance (.64) was greater than the factor correlation between avoidance and hypervigilance (.45). Table 8 presents the correlation matrix between the factors of the aroused intrusion model. It is the squared factor correlations for the Aroused Intrusion Model with AVE values in the diagonals.

Table 8
Squared Factor Correlations for the Aroused Intrusion Model

	Aroused Intrusion	Numbing	Avoidance	Hypervigilance
Aroused Intrusion	.35			
Numbing	.59	.45		
Avoidance	.49	.21	.64	
Hypervigilance	.94	.69	.45	.41

Secondary Analysis

Lastly, it was hypothesized that there is no difference on the manifest variable numbing among participants across the six racial and ethnic groups. For the secondary analysis, a one-factor ANOVA test was conducted with SPSS 18.0 to test the null hypothesis (George & Mallery, 2010). First, it was necessary to confirm that the numbing construct could be used as an observed variable for the ANOVA. Therefore, the Cronbach alpha reliability test was conducted. Since the test resulted in an alpha value of .80, the ANOVA was continued. The numbing construct was created from the average of the following HTQ-R items: HTQ4, HTQ5, HTQ12, HTQ13, and HTQ14.

Before the ANOVA was conducted, the data were tested for normality and homogeneity of variance using the Shapiro-Wilk (Shapiro & Wilk, 1965) and Levene tests (Levene, 1960), respectively. The Shapiro-Wilk normality test results showed significance, $p < .001$. Although the significant results suggest that the data are not normally distributed, Stevens (2009) asserted that non-normality has only a slight effect on Type I error. To assess equality of variance, Levene's test was conducted. The results of the test were not significant, $p = .950$, suggesting that the assumption of homoscedasticity was met. As a result, the one-way between groups ANOVA was conducted and indicated that there were no significant differences in Numbing by ethnicity, $F(5, 131) = 1.77, p = .123$, based on the means of the six Ethnic Identity groups listed in Table 1. Table 9 provides the one-factor ANOVA results.

Table 9
ANOVA Summary Table for Numbness by Ethnicity

Source	<i>SS</i>	<i>df</i>	<i>MS</i>	<i>F</i>	<i>p</i>
Ethnicity	5.11	5	1.02	1.77	.123
Error	75.57	131	0.58		

Post Hoc Confirmatory Factor Analysis

Although the first hypothesis was focused on determining model superiority, neither of the two proposed models seemed to provide the best fit for the data. Based on the results of the primary analyses, a four-factor structure may not be the best fit for the posttraumatic stress symptomatology. An additional CFA was conducted to determine if the previously accepted *DSM IV-TR* PTSD three-factor structure would fit better (American Psychiatric Association, 2000). The results of the three-factor model for PTSD presented a poor fit for the data (RMSEA = .087, SRMR = .069, CFI = .84, AIC = 5968.03). Furthermore, $\chi^2(101) = 206.669$, $p < .001$ for the *DSM-IV-TR* model was higher than for the aroused intrusion model, $\chi^2(98) = 202.43$, $p < .001$, or the dysphoria model, $\chi^2(98) = 202.01$, $p < .001$. This seems to suggest that both the aroused intrusion model and the dysphoria model provide a much better fit than the three-factor model. Table 10 presents the factor loadings for the *DSM-IV-TR* PTSD model (American Psychiatric Association, 2000).

Table 10*Factor Loadings for the DSM-IV-TR PTSD 3-Factor Model*

Latent construct	Manifest variable	Estimate	Standard error	<i>p</i>	Standardized estimate
Reexperiencing	HTQ1	1.00	-	-	.72
	HTQ2	4.62	4.09	.25	.54
	HTQ3	3.54	3.19	.26	.63
	HTQ16	2.91	2.60	.26	.65
Avoidance	HTQ4	1.00	-		.69
	HTQ5	1.16	0.18	<.001*	.57
	HTQ11	1.02	0.16	<.001*	.56
	HTQ12	0.87	0.17	<.001*	.62
	HTQ13	0.90	0.16	<.001*	.70
	HTQ14	0.98	0.16	<.001*	.62
	HTQ15	1.09	0.18	<.001*	.48
Increased Arousal	HTQ6	1.00	-		.64
	HTQ7	1.26	0.22	<.001*	.58
	HTQ8	1.05	0.19	<.001*	.54
	HTQ9	1.07	0.20	<.001*	.64
	HTQ10	1.23	0.21	<.001*	.66

Note. * $p \leq .050$. Otherwise $p > .050$.

CHAPTER V

Discussion

Implications of the Results

Although it was hypothesized that the four-factor aroused intrusion model (Rasmussen, Smith, Keller, 2007) would have a significantly better fit to the data than the dysphoria model (Simms, Watson, & Doebbeling, 2002), the results indicate that the latter was actually marginally a better fit than the former, although the difference is negligible. These findings could possibly be attributed to a cultural influence. Specifically, Rasmussen, Smith, and Keller (2007) found that the aroused intrusion model was the best fit for a sample composed of solely African refugees seeking services at a torture treatment clinic. On the contrary, there was heterogeneity in the present study in terms of culture. Participants were from diverse countries of origin.

Previous factor analytical investigations have evaluated the superiority of models of posttraumatic stress symptoms (King et al., 2009; Rasmussen, Smith, and Keller, 2007; Simms, Watson, & Doebbeling, 2002). The results of the current study support previous research, which suggests that a four-factor structure is preferred over the previously accepted three-factor model (American Psychiatric Association, 2000; Rasmussen, Smith, and Keller, 2007; Simms, Watson, & Doebbeling, 2002). Despite the preference for a four-factor model over the three-factor model, the findings indicate that both the aroused intrusion model and the dysphoria model presented only an acceptable fit. Although these findings suggest that a four-factor structure may not be the best model, it is important to take into consideration the current study's limitations, which are discussed in the next section.

Secondly, it was hypothesized that the constructs of avoidance and emotional numbing are two discrete factors in the aroused intrusion model (Rasmussen, Smith, Keller, 2007). Based on the standardized estimates of factor loadings, AVE values, and reliability, there seemed to be sufficient convergent validity for both the numbing and avoidance constructs of the aroused intrusion model. In other words, the HTQ-R items, which are indicators of the numbing construct converge. Similarly, the HTQ-R items that are indicators of the avoidance construct share a high proportion of variance in common. Additionally, there was some support for adequate discriminant validity for these two factors. This means that there are specific HTQ-R items that represent only the construct of numbing, while there are particular HTQ-R items that represent only the construct of avoidance. These results are consistent with previous research, which suggested that Criterion C of the *DSM-IV-TR* PTSD model is best separated into two factors (Rasmussen, Smith, & Keller, 2002). Although the findings support the hypothesis that emotional numbing and avoidance are two distinct factors, the overall aroused intrusion model did not appear to have high convergent or discriminant validity, based on the reliability and validity analyses that were conducted. Therefore, the findings of the validity and reliability analyses do not support overall model fit.

There was support for the final hypothesis. The findings indicated that there were no significant differences in the construct of emotional numbing by ethnicity. Previous studies (Asmundson, Stapleton, & Taylor, 2004; Palmieri, Marshall, & Schell, 2007; Rasmussen, Smith, & Keller, 2007) have suggested that numbing corresponds to an autonomic nervous system (ANS) response. If numbing is an

involuntary ANS reaction, then it should be generalizable across demographics. In other words, one would expect little or no variability among populations for numbing, since it is an autonomous human reaction (i.e., not influenced by one's culture). Since the difference between means was not statistically significant, numbing appears to be most likely an ANS response (i.e., not culturally-bound), but this warrants further research.

Limitations of the Current Study

There were some limitations to the current study. Like previous studies, it was challenging to have an operational definition of torture. Therefore, the participants were included based on their eligibility to receive services at the Florida Center for Survivors of Torture. Although the sample size was sufficient to conduct the CFAs, it was not large. Additionally, six cases were not analyzed because of missing responses. It was not possible to add new cases due to the archival nature of the sample. Similarly, it was not possible to split the sample and to replicate the final model to confirm the findings. It was also not possible to test measurement invariance across cultures (i.e., to assess how well the aroused intrusion and dysphoria models would generalize across ethnic groups).

The limitation of sample size also hindered further post hoc analyses. Since the findings indicate that the four-factor model provided only an adequate fit, it could have been useful to conduct an exploratory factor analysis on the complete HTQ-R (i.e., conducting an EFA on more than just the 16 HTQ items). Conducting an EFA with a greater number of observed variables would increase the likelihood of accurately determining model superiority. Therefore, another limitation of the current

study could be the insufficient sample size required to analyze all of the items on the HTQ-R.

Due to the medium sample size and the use of listwise deletion, it is important to take into consideration statistical power when interpreting the findings. In addition, based on the significant skewness and kurtosis test results, the multivariate normality assumptions were violated. Although these assumptions were violated due to the high level of discreteness in the data (i.e., there were only four response options for each item), the Mahalanobis distances indicated that multivariate normality was adequate for conducting the CFAs. Overall, however, caution needs to be exercised when interpreting the results of the current study.

Recommendations for Future Research

Further research is recommended in order to determine model superiority for posttraumatic stress symptomatology among torture survivors. Although the present findings indicate a preference for the four-factor structure over the three-factor structure, both the aroused intrusion model and the dysphoria model presented only an acceptable fit. Additionally, it is important to expand on previous research through studies that develop and examine a new model, which corresponds to the current *DSM-5* criteria for PTSD (American Psychiatric Association, 2013). The four-factor models presented previously in research have been based on the *DSM-IV-TR* criteria (American Psychiatric Association, 2000; King et al., 2009; Rasmussen, Smith, and Keller, 2007; Simms, Watson, & Doebbeling, 2002). Again, the current study had some limitations, so more research could help to confirm the present findings and/or to help determine which model fits best for torture survivors. Furthermore, it would

be worth exploring additional models of traumatic stress reactions, especially Herman's (1997) conceptualization of complex posttraumatic stress disorder (cPTSD), because it takes into account prolonged, repeated trauma.

For the effective clinical treatment of international torture survivors, it is important to discern any cultural differences in the effects of prolonged trauma. Therefore, it is also recommended that more factor analytical investigations be conducted with a demographically heterogeneous sample of torture survivors. More specifically, it would be helpful to conduct multiple-group CFAs in order to test measurement invariance (i.e., how a model might generalize to various ethnic groups) across populations.

It would also be helpful to replicate the current study's finding that emotional numbing and avoidance are separate factors. There has already been considerable empirical support (Asmundson, Stapleton, & Taylor, 2004; King, Leskin, King, & Weathers, 1998; Litz, 1992; Palmieri, Marshall, & Schell, 2007; Rasmussen, Smith, & Keller, 2007) for this claim, but it would be helpful to conduct more studies and to generalize these findings to international torture survivors.

Lastly, it would be beneficial to conduct more research that would examine whether or not emotional numbing is part of an autonomic nervous system (ANS) reaction. It could be helpful to know whether various symptoms are involuntary reactions which are invariant across cultures. If they are not, then the underlying cause is at least partly behavioral/cultural, involving the survivor's predispositions and life experiences. Overall, by examining traumatic stress reactions and its cultural

aspects, the suggested research could help to increase the effectiveness of the treatment of torture survivors.

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APPENDIX

Description of the HTQ Items 1-16

HTQ1: Corresponds to DSM-IV-TR Criterion B1
HTQ2: Corresponds to DSM-IV-TR Criterion B3
HTQ3: Corresponds to DSM-IV-TR Criterion B2
HTQ4: Corresponds to DSM-IV-TR Criterion C5
HTQ5: Corresponds to DSM-IV-TR Criterion C6
HTQ6: Corresponds to DSM-IV-TR Criterion D6
HTQ7: Corresponds to DSM-IV-TR Criterion D3
HTQ8: Corresponds to DSM-IV-TR Criterion D1
HTQ9: Corresponds to DSM-IV-TR Criterion D4
HTQ10: Corresponds to DSM-IV-TR Criterion D2
HTQ11: Corresponds to DSM-IV-TR Criterion C2
HTQ12: Corresponds to DSM-IV-TR Criterion C3
HTQ13: Corresponds to DSM-IV-TR Criterion C4
HTQ14: Corresponds to DSM-IV-TR Criterion C7
HTQ15: Corresponds to DSM-IV-TR Criterion C1
HTQ16: Corresponds to both DSM-IV-TR Criteria B4 and B5